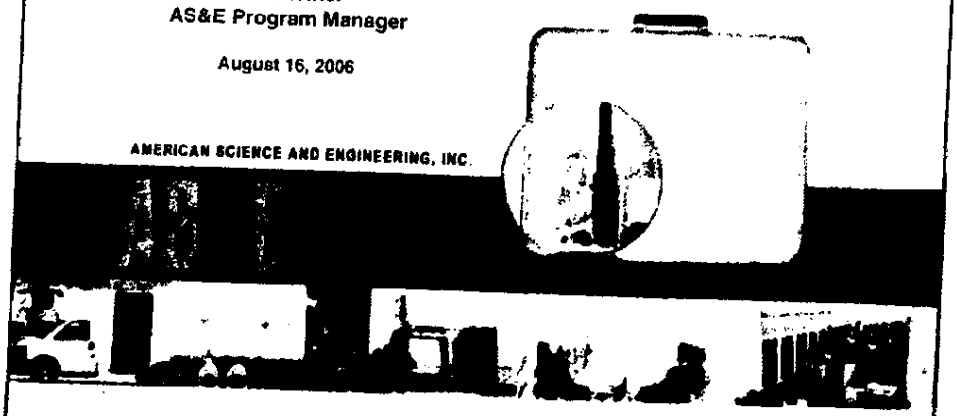
BomDetec

Kick-off Meeting

Mike Winer
AS&E Program Manager

August 16, 2006

AMERICAN SCIENCE AND ENGINEERING, INC.



Team

- *Mike Winer – Program Management*
- *Peter Rothschild – Science (Principle Investigator)*
- *Rajen Sud – Systems Engineer (EE)*
- *John Handy – Software Engineer*
- *TBD – Mechanical Engineer*
- *Brian Sullivan – Finance*
- *Rich Wronski – Product Management*

Bodysearch Reveals Both Metallic and Non-Metallic Objects

750 gm Cocaine simulant

Wrist Watch

Coin

9mm Handgun

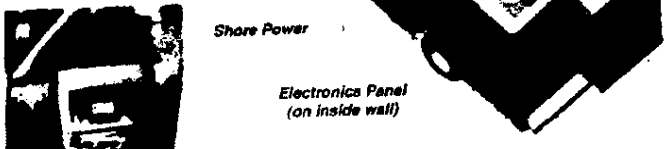
500 gm Cocaine Simulant

9mm Glock with plastic handle

File

Plastic Knife

Schematic of the Z Backscatter Van (ZBV)



Backscatter Detectors

X-Ray Source

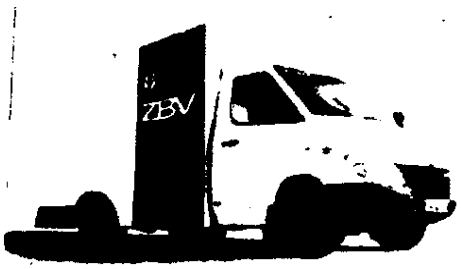
Generator

Shore Power

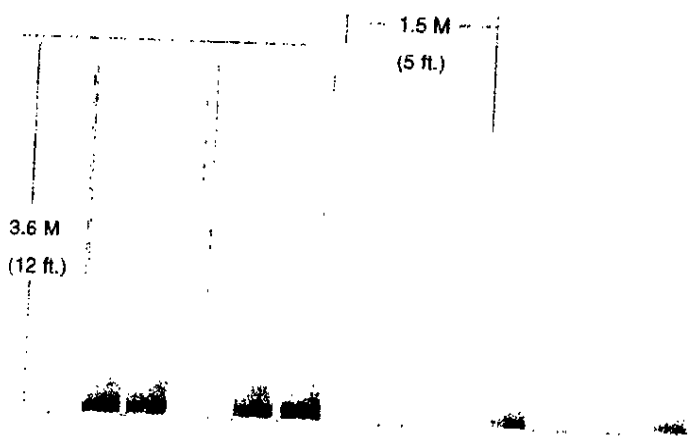
Electronics Panel (on inside wall)

A/C

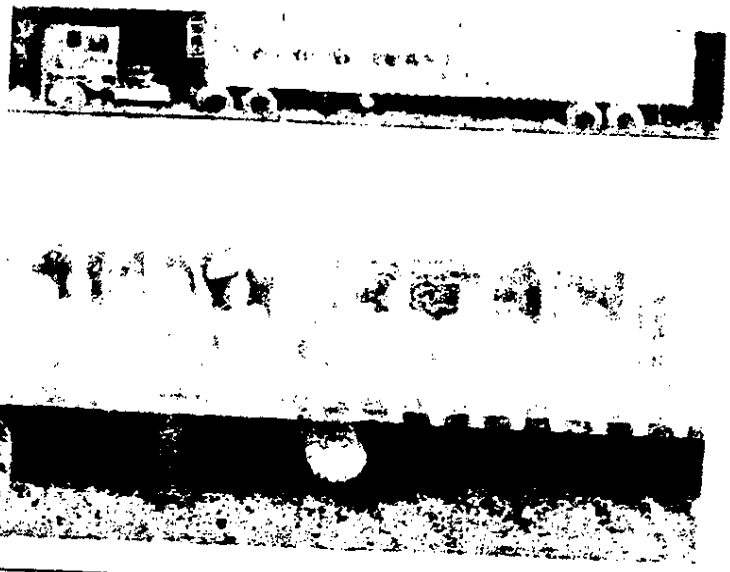
- Single-Sided Inspection
  - Side set at Factory
- Backscatter Only
  - 225 KeV
- Vehicle Offering
  - Mercedes Sprinter (Diesel)
- 1 or 2 Operators
- Multiple Speeds
  - 0.5, 1.5, 5 & 10 kph
  - 0.3, 1, 3, & 7 mph
- RTD Option



ZBV System Field of View



Backscatter Image of Illegal Immigrants



Challenges with Long-Distance Imaging

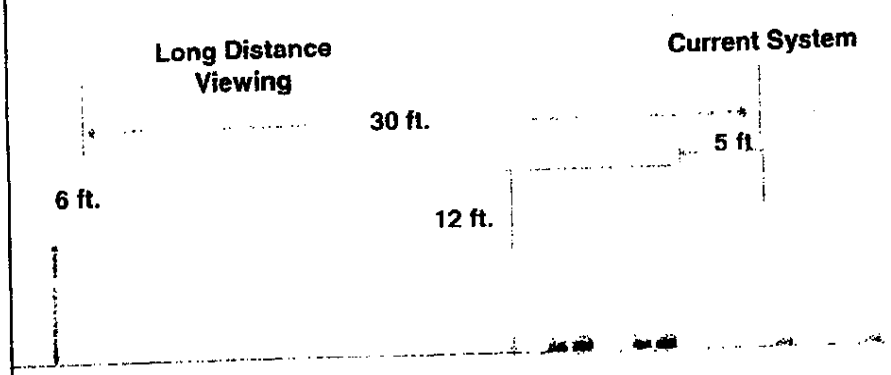
- X-ray beam is diverging so resolution of image decreases rapidly with distance
- Backscatter signal decreases by the square of the distance due to geometry (going from 5 feet to 30 feet reduces the detected signal by 1/36)
- Air scatter further reduces the detected backscatter signal and creates a background "fog"

Solution

- High power x-ray source with a small focal spot (powerful beam with low divergence)
- Collimate primary beam to prevent air scatter into detectors
- Collimate detectors so that they cannot see the air scatter
- Used pulsed x-ray sources to reduce contribution of detector noise to the backscatter signal

Long Distance Viewing (LDV) – 30 feet

- **Increased range – Requires more X-ray flux**
  - **Can be achieved with a smaller FoV**



DISCLAIMER ABOUT SCANNING PEOPLE

- **RADIATION DOSE IS EXTREMELY LOW**
  - Radiation dose from the LDV is measured in tens of micro-R.
  - People who are scanned by the LDV will not be harmed
- **LDV is not, and will not be, a "certified people scanner"**
  - Dose is too high to comply with N43.17, which requires dose per scan ≤ 10 micro-R
  - ANSI N43.17 is the only standard which addresses the issue of irradiating people for security applications
  - This standard was designed for applications such as BodySearch
  - This standard is neither a law nor a regulation. Neither ANSI nor CDRH certifies that equipment complies with the standard.
  - ANSI N43.17 requires many additional safety features which would be difficult or unfeasible to implement in the LDV system
  - ANSI N43.17 requires that people give consent to be scanned. Therefore it is not applicable to covert operations

Center for Subsurface Sensing and Imaging Systems

BomDetec Program
Phase I Kick-Off Meeting
August 16, 2006

HSARPA - Sponsor

Northeastern University (Lead)
- Siemens CR&D
- Raytheon
- AS&E
- RPI
- PPT

Kick – Off Meeting Agenda

- Opening Remarks & Introduction
- Program Overview
- Operational Overview
- BomDetec Sensors
  - Intelligent Video
  - Millimeter Wave Radar
  - X-ray Backscatter
  - Terahertz
- Integration of Software and Hardware
- Programmatic Discussion

Program Strategy

- Suicide Bomber Detection
  - Person
  - Metal
  - Explosive
- There is No Silver Bullet
- A Flexible Platform or "Mainframe"
  - Capable of Adapting to Future Technological Advances

Program Overview

- A Flexible Mainframe
  - Software
    - Coordinate System (X, Y, Z)
    - Tracking System for People in the FOV
    - GUI
    - Data Analysis, Fusion
    - Database
  - Hardware
    - VAN
      - Power
      - Thermal Regulation
      - Mechanical Support
    - Sensors
    - *(Intelligent Video, Radar, X-ray, Terahertz, Other)*